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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Koichi OKADA et al.
Application No.: 10/661,574
Filed: September 15, 2004
For: DATA MIGRATION METHOD FOR DISK APPARATUS
Group: 2186
Examiner: Not yet assigned

SUPPLEMENTAL PETITION TO MAKE SPECIAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

May 11, 2005

Sir:

Supplemental to the Petition to Make Special filed on January 22, 2004,
please consider the following additional remarks before issuing a Decision on
Petition.

REMARKS

Applicants provide the following additional remarks including more details on the cited references.

The present invention as recited in the claims filed are not taught or suggested by any of the above noted references whether taken individually or in combination with each other or in combination with any of the other references now of record.

The present invention as recited in the claims is directed to controlling an interface command of a disk apparatus of a computer system including one or more host computers, an old disk apparatus connected prior to the host computers, and a new disk apparatus newly connected to the host computers via a switch, including: changing-over and connecting the old disk apparatus to the host computers via the switch being connected to the new disk apparatus and executing data migration from the old disk apparatus to the new disk apparatus via the switch; identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data; and sending the command for inquiring the disk identification to the old disk apparatus.

It is submitted that the cited references, whether considered alone or in combination, fail to disclose or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to disclose or suggest changing-over and connecting the old disk apparatus to the host computers via the switch being connected to the new disk apparatus and executing data migration from the old disk

apparatus to the new disk apparatus via the switch, and/or identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or an access path for changing-over and connecting said host computers to said old disk apparatus via a switch connecting said new disk apparatus, and/or means for executing data migration from said old disk apparatus to said new disk apparatus via said switch, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

All of the independent claims recite at least one of these features. In particular, independent claim 1 recites changing-over and connecting the old disk apparatus to the host computers via the switch being connected to the new disk apparatus and executing data migration from the old disk apparatus to the new disk apparatus via the switch, identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and sending the command for inquiring the disk identification to the old disk apparatus. Independent claim 4 recites an access path for changing-over and connecting said host computers to said old disk apparatus via a switch connecting said new disk apparatus, means for executing data migration from said old disk apparatus to said new disk apparatus via said switch, means for identifying

data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and an access path for sending an inquiring command of said disk identification to said old disk apparatus.

The references considered most closely related to the claimed invention are briefly discussed below:

U.S. Patent Publication No. 2003/0212854 A1 (Kitamura et al.) discloses in the computer system where the plurality of host computers and the plurality of storage apparatuses are interconnected, in order to carry out the data migration between the storage apparatuses transparently to the host computers, the back end server provides the virtual disk to the host computers. From the host computers, at first, the virtual disk looks the same as the old storage subsystem. When migrating the data from the old storage subsystem to the new storage subsystem, at first, the back end server instructs the data migration unit to execute the data migration processing. Subsequently, the back end server switches the setting of the virtual disk, thereby causing the virtual disk to correspond to the new storage subsystem. However, Kitamura et al., at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch,

and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

U.S. Patent No. 6,708,232 (Obara) discloses online data migration method for transferring data from a computer and an existing storage system using the conventional interface such as SCSI to a new storage system using SAN. This includes: disconnecting the connection between the computer and the first storage system with first interface protocol, connecting the computer to a switch connected to a second storage system with a second interface protocol through first protocol converter having protocol converting facility, connecting the switch to the first storage system through second protocol converter, and migrating data in the first storage system into the second storage system via the switch. However, Obara, at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

U.S. Patent No. 6,647,476 (Nagasawa et al.) discloses in order to enable data migration between old and new subsystems to be performed under stopless operation, a plurality of first access paths and are prepared between a CPU and an old CU (old subsystem) having an old VOL and a plurality of third access paths and

are set between the old CU and a new CU (new subsystem) having a new VOL. The connection is switched from the first access paths and of the old subsystem as a replacement source to the second access paths and of the new subsystem as a replacement destination on a plurality of occasions. When the CPU accesses the new subsystem via the second access paths and on the new subsystem side during the connection change, a path replacement controller relays the access to the old subsystem via the third access paths and allows the access to be processed. Data migration from the old subsystem to the new subsystem is executed after all of the first access paths are switched to the second access paths. However, Nagasawa et al., at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

U.S. Patent No. 6,374,327 (Sasaki et al.) discloses a method, apparatus and computer program for controlling data migration in an information processing system which includes a central processing unit (CPU), a new storage system connected to the CPU and an old storage system connected to the new storage system. In the information processing system data migration is conducted to transfer data from the

old storage system to the new storage system. The invention operates by permitting access by the CPU to the storage systems during data migration. When an access by the CPU is generated the invention determines whether the access is to a region where data migration has been completed or to a region where data migration has not been completed. If the access is to a region where data migration has been completed, then processing of the access is handled by the new storage system. If the access is to a region where data migration has not been completed, then processing of the access is handled by the old storage system causing data related to the access to be transferred from the old storage system to the new storage system. The speed of data migration can be adjusted based upon the utilization of the resources of the information processing system and information of the priority of access to the new storage system by the CPU. However, Sasaki et al., at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

U.S. Patent No. 6,598,134 (Ofek et al.) discloses a system and method for providing on-line, real-time, transparent data migration from an existing storage device to a replacement storage device. The existing and replacement storage

devices are connected as a composite storage device that is coupled to a host, network or other data processing system. The replacement storage device includes a table which identifies data elements that have migrated to the replacement storage device. When a host system makes a data transfer request for one or more data elements, the replacement storage device determines whether the data elements have been migrated. If the data elements have migrated, the replacement storage device responds to the data transfer request independently of any interaction with the existing storage device. If the data elements have not migrated, the replacement storage device migrates the requested data elements and then responds to the data request and updates the data element map or table. When not busy servicing other requests, the replacement storage device operates in a background mode to migrate data elements so the data migration can occur concurrently with and transparently to system operations. However, Ofek et al., at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

European Patent No. 1 130 514 A2 (Watanabe) discloses a method of migrating data, wherein a new disk system is connected to a switch that has already

been connected to a host and old disk system. At that time, the new disk system is assigned in advance a port ID of the same value as the port ID that has been assigned to the F_Port of the switch, so that the new disk system will not be recognized from host. The new disk system read the configuration information of the old disk system. Then, in the switch, physical port ID of old disk system and physical port ID of new disk system are exchanged. The new disk system constructs volumes corresponding to the logical volume numbers and sizes of those volumes in the old disk system, and stores data of the old disk system in the corresponding volumes. However, Watanabe et al., at a minimum, fails to disclose or suggest identifying a command for inquiring disk identification as an interface command from the host computers and a command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus.

Therefore, since the references fail to disclose or suggest changing-over and connecting the old disk apparatus to the host computers via the switch being connected to the new disk apparatus and executing data migration from the old disk apparatus to the new disk apparatus via the switch, and/or identifying a command for inquiring disk identification as an interface command from the host computers and a

command for inputting and outputting data, and/or sending the command for inquiring the disk identification to the old disk apparatus, and/or an access path for changing-over and connecting said host computers to said old disk apparatus via a switch connecting said new disk apparatus, and/or means for executing data migration from said old disk apparatus to said new disk apparatus via said switch, and/or means for identifying data input output commands and a command for inquiring disk identification as an interface command from said host computers by said switch, and/or an access path for sending an inquiring command of said disk identification to said old disk apparatus, it is submitted that all of the claims are patentable over the cited references.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 520.43141X00).

Respectfully submitted,

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